

## CLAIMS

We claim:

1. In a method for equalizing a multi-channel electronic communication system by employing a reference channel of the type wherein the input signals and a generated noise are received, converted from analog to digital, channel matched, equalized using tap weight vectors, and then employed for adaptive beam forming, the improvement comprising:  
  
a step for intelligently selecting from the available operating channels of the system, a reference channel which produces improved equalization.
2. The method of claim 1, wherein the step for performing intelligent selection is accomplished by calculating which potential reference channel has the best cancellation ratio.
3. The method of claim 2, further comprising the step of updating the selected reference channel during each calibration cycle.
4. The method of claim 3, wherein the step for performing the updating is accomplished by sampling as many of the available channels as is practical given the limitations of the system and the time between cycles.
5. In a method for equalizing a multi-channel electronic communication system by employing a reference channel of the type wherein the input signals and a generated noise are received, converted from analog to

digital, channel matched, equalized using tap weight vectors, and then employed for adaptive beam forming, the improvement comprising:

the step of updating the selected reference channel during each calibration cycle.

6. The method of claim 5, wherein the step for performing the updating is accomplished by sampling as many of the available channels as is practical given the limitations of the system and the time between cycles.
7. The method of claim 6, further comprising the step of performing intelligent selection from the available operating channels of the system, a reference channel which produces improved equalization.
8. The method of claim 6, further comprising the step of performing intelligent selection from the available operating channels of the system a reference channel, which produces improved equalization, by calculating which potential reference channel has the best cancellation ratio.
9. In an apparatus for equalizing a multi-channel electronic communication system by employing a reference channel of the type wherein the input signals and a generated noise are received by a receiving component in analog form, transmitted to a converting component which provides a digital output separately to an adaptive equalization component and to an equalization filter component, the channel matching component determines and sends tap weight vectors to the equalization filter component, and the equalization filter component combines the digital output from the converter component and the tap weight vectors to generate input to the adaptive beam forming component, where the

transmission, generation, sending and providing of such signals are by appropriate means for such functions, the improvement comprising:

A means for intelligently selecting from the available operating channels of the system, a reference channel which improved equalization, the selecting means being integrated with the system such that it receives inputs from the converting and equalization filter components and provides an output to the adaptive equalization processor.

10. The apparatus of claim 9, wherein the means for selecting the reference channel is a component which determines and selects the available channel with the largest cancellation ratio.
11. The apparatus of claim 10, further comprising an updating means for performing the reference channel selection during each cycle, such updating means being structurally integrated into the selecting means component.
12. The apparatus of claim 11, wherein the updating means samples as large a number of available channels as is practical given the limitations of the system and the time between cycles.
13. In an apparatus for equalizing a multi-channel electronic communication system by employing a reference channel of the type wherein the input signals and a generated noise are received by a receiving component in analog form, transmitted to a converting component which provides a digital output separately to a channel matching/adaptive equalization component and to an equalization filter component, the channel matching component determines and sends tap weight vectors to the equalization

filter component, and the equalization filter component combines the digital output from the converter component and the tap weight vectors to generate input to the adaptive beam forming component, where the transmission, generation, sending and providing of such signals are by appropriate means for such functions, the improvement comprising:

an updating means for performing the reference channel selection during each cycle, such updating means being structurally integrated into the channel matching component.

14. The apparatus of claim 13, wherein the updating means samples as large a number of available channels as is practical given the limitations of the system and the time between cycles.
15. The apparatus of claim 14, further comprising a means for intelligently electing from the available operating channels of the system, a reference channel which produces improved equalization, the electing means being structurally integrated with the system such that it receives inputs from the converting and equalization filter components and provides an output to the adaptive equalization processor.
16. The apparatus of claim 14, wherein the means for intelligently electing the reference channel is a component which determines and selects the available channel with the largest cancellation ratio.
17. The apparatus of claim 13, wherein the means for selecting the reference channel is a component which determines and selects the available channel with the largest cancellation ratio.